HIGH SCHOOL AND UNIVERSITY MATRICULATION EXAMINATIONS BOARD.

DEPARTMENTAL EXAMINATIONS, 1928.

GEOMETRY 3.

Time—Three hours.

Values.

7 **1.** *Either* (*a*) Deduce an expression for the area of a triangle in terms of the co-ordinates of its angular points.

5 (*b*) The co-ordinates of the angular points A, B of a triangle are $(2,3)$ and $(-3,-9)$ respectively. Its area is 6 square units and the vertex C lies on the line $4x - 3y + 5 = 0$. Find the co-ordinates of the point C.

7 *Or* (*a*) Find the co-ordinates of a point which divides the straight line joining two given points in a given ratio.

5 (*b*) Find the ratio in which the straight line joining $(-5,3)$ and $(6,-1)$ is divided by the line $x-11y+3=0$.

7 **2.** *Either* Find the equation of a straight line in terms of the length of the perpendicular upon it from the origin and the angle the perpendicular makes with the axis of x.

Or Find the perpendicular distance from a given point to a given straight line.

3. Attempt *three* parts only:

6 (*a*) Find the equations of the straight lines passing through $(4,7)$ and making an angle of 45° with the line $3x-10y=8$.

6 (*b*) The equations of two sides of a parallelogram are respectively $2x+3y-7=0$ and $x-3y+4=0$. Find the equations of the other two sides if one vertex is the point $(3,2)$.

URRICULUM
B
054
2
419
928
xam.5
URR HIST

Values.

6 (*c*) What is the perpendicular distance between the parallel lines $ax+by+c=0$ and $ax+by-c=0$?

6 (*d*) Show that the lines $4x-y=34$, $3x=5y$ and $5x+3y=0$ are the sides of an isosceles right-angled triangle.

4. Attempt *three* parts only:

6 (*a*) Find the equation of the tangent to the circle $x^2+y^2=r^2$ in terms of its inclination to the axis of x.

6 (*b*) Find the equation of the circle of which (9,5) and (15,13) are the extremities of a diameter.

6 (*c*) What are the lengths of the chords cut off from the circle $x^2+y^2+x-y-6=0$ by the two axes?

6 (*d*) Find the equations of the tangents to $x^2+y^2=25$ which are parallel to $3y-4x=0$.

8 **5.** (*a*) Develop the equation of the parabola, $y^2=4ax$.

6 (*b*) From the point $(-1,0)$ are drawn two lines making angles of 45° with the axis of x. Prove that they are tangents to the parabola $y^2=4x$. Find where the corresponding normals meet the axis of the parabola.

7 **6.** (*a*) Find the equation of the tangent to an ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ in terms of its inclination to the axis of x.

6 (*b*) Find the equation of the ellipse whose centre is at the origin and which touches the line $5x+48y=169$ at the point (5,3).

7. Attempt *three* parts only:

6 (*a*) Find the sum of the distances of any point (x,y) on the hyperbola $\frac{x^2}{a^2}-\frac{y^2}{b^2}=1$ from the foci.

6 (*b*) Find the equation of the conic satisfying the following conditions: foci $(\pm 5,0)$, latus rectum $\frac{9}{2}$.

Values.

6 (*c*) Find the locus of the intersection of two tangents to the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ which are at right angles to one another.

6 (*d*) Find (i) the co-ordinates of the centre, (ii) the lengths of the axes, (iii) the eccentricity, (iv) the co-ordinates of the foci of the conic $9x^2+25y^2-54x-100y=44$.

100

Ex libris
universitatis
albertaensis